

REMARKS/ARGUMENTS

On page 2, lines 5-6 the Office implies that Applicants have acquiesced to a rejection under 35 U.S.C. § 112. Applicants in no way acquiesce or agree with the rejection spelled out in section "c" on page 3, lines 1-2 of the Office Action of January 19, 2006.

The rejection as originally presented in the January 19, 2006 Office Action makes no sense. The rejection is reproduced below for convenience:

c). The term "exclusively" in claims 2 and 4 fails to ascertain the claimed invention with precision.

There is no requirement under 35 U.S.C. § 112, second paragraph that an invention be ascertained with precision. Instead, 35 U.S.C. § 112, second paragraph states:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Regardless of the specifics of 35 U.S.C. § 112, second paragraph, Applicants submit that the meaning of the term "exclusively" in Claims 2 and 4 is easily understood by one of ordinary skill in the art; namely, it is understood to mean that the separating internals of the separating column include only mass transfer trays. The term "exclusively" takes its ordinary meaning, e.g., that any type of tray other than a mass transfer tray is excluded from the separating internals of the separating columns of Claims 2 and 4.

Perhaps the Office is of the belief that a sieve tray is not a mass transfer tray. Applicants submit that those of ordinary skill in the art readily recognize that a sieve tray is encompassed by the genus of mass transfer trays. Applicants draw the Office's attention to page 3, lines 35-37 where sieve trays are defined as follows (underlining added for emphasis):

A class among the mass transfer trays is the sieve tray. In this document, this refers to plates which have simple holes and/or slots as passages for the rising gas or vapor phrase (the terms "gaseous" and "vaporous" are used synonymously in this document).

Applicants request withdrawal of the rejection.

The Office is further of the opinion that recitation of “mass transfer trays” in dependent Claim 2 broadens the claim. Applicants submit this is not correct. Independent Claim 1 states “at least some of the separating internals being a sequence of sieve trays.” Independent Claim 1 does not state that all of the separating internals are sieve trays, instead independent Claim 1 states that only a portion of the separating internals are sieve trays. Independent Claim 1 does not exclude any type of tray nor does independent Claim 1 state that all of the separating internals are sieve trays. Independent Claim 1 states only that a portion of the trays must be sieve trays. Thus, the recitation of “mass transfer trays” in dependent Claim 2 does not broaden independent Claim 1.

With respect to the Office’s assertion that Claim 3 is at odds with Claim 1, Applicants draw the Office’s attention to, e.g., page 4, where it is disclosed that sieve trays may include trays such as dual-flow trays, trickle sieve trays, etc. Applicants further draw the Office’s attention to page 9 where other sieve trays such as hydraulically sealed cross-flow trays and valve trays are disclosed. Applicants therefore submit that Claim 3 is not at odds with either of Claims 1 and/or 2 because Claim 3 merely recites subfamilies of the family of sieve trays which is itself a subfamily of a mass transfer tray.

Applicants thus submit that the rejections detailed on page 2, section “a” of the May 25, 2006 Office Action are not supportable and should be withdrawn.

The amendment to the claims obviates the rejections presented in sections “b” and “c” on page 2 of the May 25, 2006 Office Action.

The Office further objected to the inclusion of the term “adjusting” in the claims of the Amendment filed in the present case on March 14, 2006. Independent Claim 1 is amended herein to replace the term “adjusting” with the term “feeding”. Support for the amendment is found, e.g., on page 4, lines 9-11.

The Office asserts that the present claims are obvious in view of the combination of Matsumoto (U.S. 6,294,056) and Yu (U.S. 6,345,811). Applicants traverse the rejection on the grounds that the Office failed to take into consideration that Yu teaches away from the claimed invention and further that the Office mischaracterized Applicants' evidence in support of patentability.

The Office concedes that Matsumoto is silent with respect to operating sieve trays at an entrainment fraction of 10% by weight (see page 4, lines 6-8 of the Office Action of January 19, 2006). To remedy this defect of Matsumoto, the Office cited to column 6, lines 32-36 of Yu as evidence that one of ordinary skill in the art would be motivated to operate a column having a sieve tray at an entrainment fraction of 10% by weight or more. The relevant disclosure of Yu is reproduced below for convenience.

The structure packing layer combined under the tray deck can bar the droplets entrained by the vapor and thus improves tray efficiency. The vapor entrains the droplets with lower concentration on the present tray deck onto the adjacent tray deck above and thus the liquid with higher concentration is diluted. Therefore, droplet entrainment is a phenomena of back mixing which affects the efficiency. In the normal distillation operation, the tray efficiency can be reduced by 7%-11% when the droplet entrainment is 5%-10%. The packing layer not only eliminates the entrained droplets, but also uniformly re-distributes the vapor. Moreover, the separated droplets would not be taken onto the adjacent tray deck above again due to the certain distance between the combined packing and the tray deck, and the vapor is also subjected to a re-distribution. (Column 6, lines 27-42 of Yu).

It appears that the Office is of the belief that the above-quoted disclosure of Yu is evidence that one of ordinary skill in the art would be motivated to operate a sieve tray at an entrainment fraction of 10% by weight or greater. Applicants point out that Yu, in fact, teaches that operating a sieve tray at an entrainment fraction of 5%-10% reduces tray efficiency. The Office's interpretation of Yu is directly contradictory to the prior art description. For example, Yu states that barring the entrainment of droplets improves tray

efficiency (see column 6, lines 27-29). Applicants submit that those of ordinary skill in the art readily recognize that this means that preventing or reducing entrainment improves efficiency. Thus the contrary, e.g., increasing entrainment, would logically reduce tray efficiency.

Applicants submit that those of ordinary skill in the art would have no motivation to reduce the efficiency of a separation process such as the separation process of either of Yu or Matsumoto. It makes absolutely no sense whatsoever to assert that Yu teaches those of ordinary skill in the art that a separation process can be optimized by increasing droplet entrainment between trays in view of the fact that Yu explicitly discloses that increasing droplet entrainment reduces tray efficiency.

Applicants submit that Yu explicitly teaches away from the presently claimed invention. Applicants draw the Office's attention to § 2144.05(III) where it is stated:

A prima facie case of obviousness may also be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. *In re Geisler*, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997).

Applicants further draw the Office's attention to M.P.E.P. § 2145(X)(D)(1) where it is stated:

A prior art reference that "teaches away" from the claimed invention is a significant factor to be considered in determining obviousness; however, the nature of the teaching is highly relevant and must be weighed in substance.

In the present case, the teaching away explicitly disclosed by Yu tells those of ordinary skill in the art that decreasing entrainment improves tray efficiency. This teaching is highly relevant to Applicants' claimed invention which requires the opposite; namely, increased entrainment. In the claimed invention an entrainment of greater than 10% by weight must occur whereas Yu states that high entrainment (e.g., entrainment of from 5 to 10%) is known to reduce tray efficiency. Yu's disclosure is highly relevant to the claimed

invention because both Yu and the present invention are related to separation processes such as distillation.

In view of the discussion above, Applicants submit that those of ordinary skill in the art would not be motivated by the disclosure of Yu to arrive at the presently claimed invention at least because Yu discloses that entrainment decreases tray efficiency, a factor which would not be considered desirable by one of ordinary skill in the art carrying out a thermal separation process.

Applicants request withdrawal of the rejection.

Applicants included a discussion of the advantages observed in the claimed invention in the paragraphs bridging pages 5 and 6 of the amendment filed on March 14, 2006. The Office's response to these comments is incomprehensible. In portions of the rejection it appears that the Office is using Applicants' specification as evidence of obviousness. Applicants submit that such a use of Applicants' disclosure is prohibited at least because Applicants' disclosure is not prior art.

Further, the Office appears to disregard any consideration of the data of the specification as probative to patentability on the ground that the data it is not a comparison with the closest prior art. This makes no sense. In Examples 1 and 2 Applicants show that when a separation column is operated with an entrainment fraction of 25% or 56% by weight, respectively, the formation of polymer in sections of the separation column is avoided. In contrast, when the separation column is operated at an entrainment fraction of 10% by weight, Applicants show that 50 kilogram of undesired polymer is formed in the separation column.

Applicants submit that the Inventive and Comparative Examples show that carrying out a process under conditions of high entrainment fraction (i.e., an entrainment fraction greater than 10% by weight) provides an unexpected advantage; namely, no polymer is

formed in the separation column. Nothing in the prior art relied upon by the Office discloses or suggests that increasing entrainment fraction provides any advantages. Instead, the prior art states that increasing entrainment fraction results in reduced tray efficiency which is certainly not an advantage.

The Office did not provide any reasoning why Applicants' examples showing the avoidance of polymer formation would be expected. Applicants thus submit that the Office did not fully consider Applicants' arguments and/or data and respectfully request reconsideration.

Moreover, even though Example 1 of the specification is carried out at an entrainment fraction of 25% by weight, the separation action (e.g., the efficiency of the separating process) "was substantially unchanged compared to the comparative example." (See page 14, lines 27-28). Thus, not only have Applicants demonstrated that polymer formation can be avoided, Applicants have further demonstrated that the claimed process can be carried out without sacrificing separating action, e.g., the efficiency of the separating process, a result that Applicants submit must be unexpected in view of Yu's disclosure that increasing entrainment results in reduced efficiency.

For the reasons discussed above, Applicants submit that all now-pending claims are in condition for allowance and respectfully request early notification of the same.

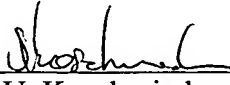
Respectfully submitted,

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